STATE OF MONTANA
DEPARTMENT OF ADMINISTRATION
STATE PERSONNEL DIVISION

POSITION DESCRIPTION

ALLOCATION: To be completed after final classification approval by the State Personnel Division or by agencies with delegated classification authority:

Class Code	*Title*	*Grade*

*** PART I: Identification ***

CURRENT CLASSIFICATION:
Code:019058 Title: Materials Laboratory AideGrade: 8

AGENCY: ***Agency Code: 5401*** ***Position No: 94032***

Department	*Division*
TransportationEngineering	

Bureau
Materials

ADDRESS:

Building & Street	*City*	*ZipBusiness CodeTelephone*
2701 ProspectHelena59620444-6293		

FUNCTIONAL DESCRIPTION OF THE WORK UNIT:
The Helena Materials Bureau is located in the Engineering Division of the Department of Transportation, and is responsible for establishing all sampling and testing policies and procedures for materials used in state and federal highway and bridge construction. The Materials Bureau tests all materials used in the construction of highways to make sure they meet contract specifications. A wide range of tests are performed on concrete, asphalt, aggregates, soils, paint, water, fertilizer, wood, steel and other products. The Materials Bureau, through district lab and field inspections, monitors sampling and testing procedures throughout the year. District and area laboratories monitor field personnel and the Materials Bureau offers technical assistance as needed. The Bureau is responsible for the testing of all materials incorporated into the highways including preconstruction, construction, and maintenance. The Bureau is also responsible for all geotechnical and core drilling work

performed by the Department, nuclear gauge repair, equipment calibration, safety training, materials manual, and information services. Sections within the Materials Bureau include Geotechnical, Physical Testing, Pavement Management, and Materials Services.

*** Part II: Job Description ***

This position is responsible for performing routine testing procedures on materials used in highway and bridge construction to ensure compliance with state and federal regulations, and for assisting Materials Lab Technicians with aspects of more complex testing procedures (i.e., preparing samples, setting up tests, calibrating equipment, etc.). This work involves the application of technical testing methods and procedures which vary dependant upon the type of material tested. The position will work in various sections in the Bureau as workload demands change. The position reports to the Lab Supervisor, and Lab Technician (lead worker) and does not supervise others.

The information on this job description has been designed to indicate the general nature and level of work performed by employees within this classification. It is not designed to contain or be interpreted as a comprehensive inventory of all duties and responsibilities required of all employees assigned to this job (i.e., it is not intended as a procedural manual, and employees may be required to perform some tasks not listed here). ***All duties documented below are considered essential to the position.***

1. <u>ASSIGNED DUTIES</u>:

A.Prepare samples for testing to assist technicians by choosing and applying procedures based on the type of material, referring to the manual, and receiving specific instructions from technicians. This involves technical processes such as preparing molds, weighing, washing, shaking, crushing, and splitting samples. This involves observations as to the height, width, volume, dryness and other physical properties of the sample, and making adjustments as needed (e.g., extending drying times, re-shaking, etc.). Accuracy is critical in tasks such as splitting samples. The work requires knowledge of materials inspection and testing procedures, the properties and characteristics of a variety of materials, national and state standards and methods, and skill in the operation of laboratory testing equipment such as scales and balances, molds, shakers, crushers and compactors. Examples of tasks include: ***45%***

1.Compact test specimens of bituminous mix for further Marshall testing by placing specific amounts of a sample, at a specific temperature (as outlined in the manual), spading the mixture to ensure uniform mixing of the sample, and placing the mixture on the mold holder, and compacting to testing specifications.

2.Mold concrete for further testing by selecting concrete from the mixing pan, ensuring it is a representative sample of the batch, re-mixing to prevent segregation during molding, tamping the mold, and consolidating the sample, and adding extra amounts to ensure the concrete will exactly fill the mold after compaction.

3.Prepare soil samples by drying using a variety of methods (air, oven, hot plate) following procedures for the required test. This involves determining how to dry the sample based on available time and soil types (different soils dry differently).

B.Performs routine testing, such as mixing, resistance values, Rice gravity, compaction of soils and aggregate, washing samples, volume swells, batching and shaking, etc., and records test data. This information is used by technicians and supervisors to calculate and create a final record of test results. The work requires close attention to detail and procedure in the execution of AASHTO and Materials Manual testing procedures. ***45%***

1.Determine procedure to follow based on the type of material sampled, it's intended use, and instructions from the supervisor and higher level technicians, and following detailed procedures outlined in the Montana Materials Manual of Test Procedures.

2.Executes testing procedures as outlined in the Materials Manual. The aide will not deviate from established procedures, and will seek assistance from higher level technicians on situations which are unclear. Examples of typical procedures run include:

a.Rice gravity procedures. Separates particles of bituminous mix samples to oprepare fine sample for testing, which may involve heating the sample to facilitate breakup. Cools sample. Adds designated amount of water to flask, and weighs water and flask after calibrating, records weights on the worksheet (i.e., weigh water and flask prior to adding sample), add sample and weigh and record the net weight of the sample on the worksheet. Higher level technicians will then use this information for further processes in the test e.g., vacuum, flask determination, calculating specific rice gravity, etc.

b.Performs sieving procedures on fine and coarse aggregate in order to provide information used to determine particle size distribution. This involves preparing sieving apparatus by nesting sieves in order of decreasing size; determining the proper amount of material to put on the sieve so that all particles have an opportunity to reach a sieve opening and using a chart that shows the maximum weight that can be retained on sieves; striking and rotating sieve (or using a mechanical shaker) following prescribed standards until not more than 0.5 percent of the total sample passes through any sieve. Sieve size is then used to determine particle size.

3Records test data for use by technicians and the supervisor in calculating and summarizing test results. This work involves the application of conversion factors and tables, and algebraic equations.

C.Clean and inspect testing equipment to ensure it is in proper functioning order, and to report observed malfunctions or damaged equipment to the supervisor. This involves tasks such as checking splitters to ensure that the device is cleaned, checking gradation sieve screens for proper size, and checking drop heights of compaction hammers. The position makes necessary routine adjustments to equipment to ensure it is within specifications and accurate. 5%

D.Perform miscellaneous support duties such as cleaning the lab, observing and reporting unsafe conditions, delivering samples and supplies to various areas of the lab, running errands, etc. 5%

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2. <u>WORKING CONDITIONS AND PHYSICAL DEMANDS</u>:

The predominant work is performed in a controlled lab environment involving exposure to testing equipment, caustic chemicals (hot asphalt, lime, acids, mercury, and other chemicals), dust and fumes. The position works with hot materials and equipment (steel molds, ovens at 350 degrees, hot plates, etc.), and solvents and chemical additives which require use of protective apparel such as gloves, respirators, and eye protection. The position requires training in, and close observation of, safety practices and procedures.

The position also involves significant physical demands such as repeated lifting of 80 pound bags of aggregate into shakers/crushers and manual manipulation of testing equipment (shakers, compaction devices, sieves, etc.).

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3. <u>KNOWLEDGE, SKILLS, AND ABILITIES</u>:

The position requires knowledge of materials testing procedures, state, federal, AASHTO, and ASTM standards and project specifications, the Montana Materials manual, highway construction methods and techniques, the properties and characteristics of materials (e.g., soil, concrete, aggregate, asphalt); and safety practices and procedures. The work also requires skill in operating a variety of testing equipment (compression and tension machines, compactors, mixers, sieves, shakers, crushers, etc.), and the ability to accurately perform mathematical computations.

The required Knowledge, Skills and Abilities are typically acquired through a combination of education and experience equivalent to graduation from high school and one year experience in materials sampling and/or testing. The position requires a valid Montana Driver's license.

4. MANAGEMENT and SUPERVISION of OTHERS:

This is a non-supervisory position.

5. SUPERVISION RECEIVED:

The position reports to the Supervisor of the section to which the employee is assigned, and to lead worker technicians. The work is structured by established MDT materials testing methods and procedures. The Lab Aide generally performs routine lab testing tasks according to strict procedures, or works under the direct guidance of a higher level technician. ***References available are the Montana Materials Manual of Test Procedures, Montana Standard Specifications for Road and Bridge Construction, project specifications and engineering designs, FHWA,*** AASHTO, and ASTM ***standards.*** Results of testing are reviewed by the lead worker and supervisor prior to final approval.

6. SCOPE and EFFECT:

Actions directly affect the accuracy of testing of materials used in highway and bridge construction in conformance with established MDT, national, and project specifications and criteria, and affect the preparation of samples for further testing by technicians. Decisions concern applying established procedures under the guidance of technicians, and affect the conformance of sample preparation and test execution according to explicit procedures.

7. PERSONAL CONTACTS:

Contacts are with the supervisor and technicians to exchange information regarding specific assignments, and to discuss information such as testing procedures, mathematical conversions, and equipment operations.

***PART III: Signatures ***

IMMEDIATE SUPERVISOR

To the best of my knowledge, the statements in Parts I and II are accurate and complete.

Signature:_____ Date:_____

Name:_____ Title:_____
(Please Print) (Please Print)

ADMINISTRATIVE REVIEW

Signature:_____ Date:_____

Name: _____ ***Title:*** _____
(Please Print) ***(Please Print)***

Agency Director
or Designee:

Signature: _____ ***Date:*** _____

Name: _____ ***Title:*** _____
(Please Print) ***(Please Print)***